

NOV/FY06

**LAKE CITY ARMY AMMUNITION
PLANT
Missouri**

**Army Defense Environmental
Restoration Program
Installation Action Plan**

FINAL July 17, 2006

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Statement of Purpose

The purpose of the Installation Action Plan (IAP) is to outline the total multi-year Installation Cleanup Program for an installation. The plan will identify environmental cleanup requirements at each site or area of concern, and propose a comprehensive, installation-wide approach, with associated costs and schedules, to conduct investigations and necessary remedial actions.

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All site-specific funding and schedule information has been prepared according to projected overall Army funding levels and is, therefore, subject to change.

The following agencies contributed to the formulation and completion of this Installation Action Plan at the IAP Workshop held 17 November 2005:

Alliant TechSystems (ATK)
ARCADIS
Engineering and Environment, Inc. for USAEC
Lake City Army Ammunition Plant
Missouri Department of Natural Resources
US Army Corps of Engineers, Kansas City Division
US Army Environmental Center

Acronyms & Abbreviations

ABLF	Abandoned Landfill
AEDB-R	Army Environmental Data Base-Restoration
AFSC	Army Field Support Command
AOC	Area of Concern
AOI	Area of Interest
ARCADIS	PBC Contractor
ATK	Alliant TechSystems
BLRA	Baseline Risk Assessment
BRAC	Base Realignment and Closure
CERCLA	Comprehensive Environmental Response Compensation and Liability Act (1980)
COC	Contaminants of Concern
COE	Corps of Engineers
CTC	Cost to Complete
cy	cubic yards
DA	Department of Army
DERP	Defense Environmental Restoration Program (now ER,A)
DD	Decision Document
DOE	Department of Energy
DU	Depleted Uranium
EE/CA	Engineering Evaluation/Cost Analysis
ER,A	Environmental Restoration, Army (formerly DERA)
FFA	Federal Facility Agreement
FS	Feasibility Study
FY	Fiscal Year
GFPR	Guaranteed Fixed-Priced Remediation
GW	Groundwater
HRS	Hazard Ranking System
IAG	Interagency Agreement
IAP	Installation Action Plan
IRA	Interim Remedial Action
IRP	Installation Restoration Program
IWOU	Installation-wide Operable Unit
IWTP	Industrial Wastewater Treatment Plant
K	\$1,000
K046	RCRA Hazardous Waste Code for wastewater treatment sludges from manufacturing, formulation and loading of lead-based initiating compounds (CFR 261.32)
LCAAP	Lake City Army Ammunition Plant
LTM	Long-term Management
MCL	Maximum Contaminant Level
MDNR	Missouri Department of Natural Resources
MEC	Munitions Explosive Constituents
MIP/CPT	Membrane Interface Probe/Cone Penetrometer Technique
MMRP	Military Munitions Response Program
MPVE	Multi-phase Vapor Extraction
NAPL	Non-aqueous Phase Liquid
NE	Not Evaluated
NECOU	Northeast Corner Operable Unit
NPL	National Priority List

Acronyms & Abbreviations

NRC	Nuclear Regulatory Commission
OU	Operable Unit
P&T	Pump and Treat
PA	Preliminary Assessment
PAH	Polycyclic Aromatic Hydrocarbons
PBC	Performance-based Contract
PCB	Polychlorinated Biphenyls
PETN	Pentaerythritol Tetranitrate
POM	Program Objective Memorandum (budget)
PP	Proposed Plan
PRB	Permeable Reactive Barrier
PRG	Preliminary Remediation Goals
PRW	Permeable Reaction Wall
PY	prior year
RA	Remedial Action
RA(C)	Remedial Action (Construction)
RA(O)	Remedial Action (Operation)
RAB	Restoration Advisory Board
RC	Response Complete
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RDX	Cyclotrimethylenetrinramine
REM	Removal
RI	Remedial Investigation
RIP	Remedy in Place
ROD	Record of Decision
RRSE	Relative Risk Site Evaluation
S&A	Supervision and Administration
SARA	Superfund Amendments and Reauthorization Act
SCAPS	Site Characterization Analysis and Penetrometer System
SCR	Site Characterization Report
SI	Site Inspection
SVOC	Semi-Volatile Organic Compounds
SWMU	Solid Waste Management Unit
TAPP	Technical Assistance for Public Participation
TNR	Trinitroresourcinal
TRC	Technical Review Committee
USACE	United States Army Corps of Engineers
USAEC	United States Army Environmental Center
USATHMA	United States Army Toxic and Hazardous Material Agency (now USAEC)
VOC	Volatile Organic Compounds

Installation Information

Installation Locale: Lake City Army Ammunition Plant (LCAAP) is located in Independence, (population 100,000) Missouri (in Jackson County). It is located 23 miles east of Kansas City, Missouri (population 500,000), 3 miles north of Blue Springs (population 42,000), 2 miles southwest of Buckner (population 3,040) and adjacent to the village of Lake City (population 50). Installation is 3,935 acres in area.

Installation Mission:

LCAAP is an active US Army Joint Munitions Command Installation, which manufactures and tests small caliber ammunition, including 5.56 mm, 7.62mm, 20mm, and .50 caliber rounds. It is a Government-owned contractor operated (GOCO) facility that is operated by ATK.

Lead Organization:

Major Command: Army Materiel Command

Subcommand: Joint Munitions Command

Installation: Lake City Army Ammunition Plant

Lead Executing Agencies: ARCADIS G&M, Inc, (Performance Based Contract); Alliant TechSystems

Regulator Participation:

Federal: U.S. Environmental Protection Agency (EPA), Region VII, Superfund Branch.

State: Missouri Department of Natural Resources (MDNR), Division of Environmental Quality.

NPL Status:

In 1987, the Installation was listed on the CERCLA National Priorities List (NPL) with a score of 33.62. The restoration program is managed in accordance with an Interagency Agreement – Federal Facilities Agreement.

Projected Dates for Construction Completion: 2007

Projected Date for NPL Removal: 2037*

* CTC extends for 30 years. Area 18 is expected to last 74 years for groundwater.

RAB/TRC/TAPP Status:

A Technical Review Committee met quarterly from December 1987 until December 1996. In 1996, LCAAP held a public meeting to determine interest in forming a Restoration Advisory Board (RAB). The RAB first met in May 1997 and met regularly every two months. Since January 1999, RAB meetings have been held quarterly. Workshops have been held with RAB members to explain remedial technologies. In 2005 the RAB convened five times. In addition two Public Availability Meetings were held.

Program Summaries: (There are no MMRP or BRAC sites at this installation.)

IRP

Contaminants of Concern: Explosives, Volatile and Semi-volatile Compounds, Metals, and PCBs

Media of Concern: Groundwater, Soil, Surface Water, Sediments

Estimated date for RIP/RC: 2007

Funding to Date: \$102,673,000

Current year (FY06): \$15,694,000

CTC: \$76,890,000

Cleanup Program Summary

HISTORIC ACTIVITY: Lake City Army Ammunition Plant (LCAAP) is an active U.S. Army Joint Munitions Command installation, which manufactures and tests small caliber ammunition, including 5.56mm, 7.62mm, and .50 caliber rounds. It is a Government-owned contractor-operated (GOCO) facility that is operated by Alliant TechSystems (ATK).

LCAAP was the first new Government-owned facility established in the early 1940s to expand small caliber ammunition production in the United States. Construction at this 3,935-acre facility was initiated on 26 Dec 40 and completed on 11 Oct 41. The plant has operated continuously since 1941, except for a five-year period between World War II, and the Korean Conflict. The operating contractor from 1941 to 1985 was Remington Arms. In November 1985, plant operations were assumed by Olin Corporation. ATK became the operator in 2000.

LCAAP has produced a variety of small arms ammunition since 1941, including .30 caliber, .38 caliber, .50 caliber, 5.56mm, 7.62mm, 20mm, and 30mm ammunition. During WWII, 5.7 billion cartridges were produced; during the Korean Conflict, 1.1 billion, and during the Vietnam conflict, 14.4 billion. In 1996, production was about 379 million cartridges. Production has dramatically increased over the past three years, now approaching 1.2 billion rounds per year.

PROGRAM PROGRESS:

IRP:

The three operable units – Area 18, Northeast Corner, and Installation-Wide- are in the feasibility study stage of the remedial process. Area 18 has a Record of Decision (1999) that requires amending due to additional contamination being discovered. A RI/FS addendum has been prepared, to be followed by an amended ROD. Additional remedial actions will be implemented. A pilot study employing enhanced bioremediation and bench tests using reactive iron were completed in 2005.

The Northeast Corner Operable Unit (NECOU) has a draft supplemental RI and a draft FS. A pilot study incorporating enhanced bioremediation is underway. A leachate collection system has been installed at the ABLF with leachate being collected, treated and disposed offsite.

The Installation-Wide Operable Unit (IWOU) is in the RI/FS stage. The Housekeeping Removal Action has completed removal of contaminated soil and waste from Areas 25, 26 and 15. At Area 2 the contents of the waste lagoon have been removed, but contaminated soil in the vicinity of the lagoon is being addressed in the RI/FS. At Area 31 UXO material was discovered during the removal of waste materials, and work has ceased pending revisions to the safety plans. Two EE/CAs have been prepared – LCAAP-010 Sand Piles and LCAAP-035 Sumps.

All future work, with the exception of the removal actions at LCAAP-010 Sand Piles and LCAAP-035 Sumps, will be accomplished under the PBC.

Future Plan of Action: All sites are expected to be RIP by the end of FY2007.

LAKE CITY ARMY AMMUNITION PLANT

Installation Restoration Program

Status: NPL Installation, HRS of 33.62.

AEDB-R Sites/Sites RC: 36/31 (32 sites included in PBC, the 3 sites not included are LCAAP-035 Sumps, LCAAP-010 Sand Piles, and LCAAP-027 Range. One site is the PCB site.).

Different AEDB-R Site Types:

1 Burn Area	5 Contaminated Fill	1 Contaminated Groundwater
5 Surface Disposal Area	2 Drainage Ditch	7 Surface Impoundment/Lagoon
4 Disposal Pit/ Dry Well	1 Firing Range	1 Waste Treatment Plant
1 Industrial Discharge	6 Landfill	
1 Storage Area	1 Spill Site Area	

Most Widespread Contaminants of Concern: Explosives, Volatiles and Semi-volatiles Compounds, Metals, PCBs

Media of Concern: Groundwater, Soil, Surface Water, Sediment

Total ER,A Funding:

Prior years (up to FY05):	\$102,673,000
FY2006:	\$15,694,000
Future Requirements:	\$76,890,000
Total	\$195,257,000

Duration of IRP:

Year of IRP Inception:	1979
Year of RA Completion:	2007
Year of IRP Completion:	indefinite

IRP Contamination Assessment

LCAAP is an NPL site and is jointly regulated by the U.S. EPA Region VII and MDNR. A SARA 120 Interagency Agreement (IAG) was signed by DA, EPA and MDNR and went into effect on 28 Nov 89. LCAAP is divided into three operable units: Area 18, Northeast Corner (NECOU), and Installation-Wide (I-W).

An installation assessment of LCAAP was conducted by the U.S. Army Toxic and Hazardous Materials Agency (USATHAMA) in 1979 to assess the environmental quality of the facility. This report recommended that the installation should monitor the groundwater beneath the sandpits in the northwest corner of the installation.

In 1985, USATHAMA initiated a preliminary assessment/site investigation (PA/SI) program at LCAAP. Several areas of possible contamination were identified and a sampling plan was implemented. The PA/SI involved the installation of 24 groundwater monitoring wells at seven sites, and the analysis of 48 soil and water samples. All seven areas sampled detected contaminants in the groundwater, including volatile chemicals, semi-volatiles, explosives and metals.

A Three Phase Remedial Investigation (RI) was initiated in August 1987. The first phase of fieldwork was completed in August 1988, the second phase in September 1990, and the third phase in December 1992. A total of 35 AEDB-R Sites have been identified for LCAAP.

The results of the fieldwork showed low-level groundwater contamination in several areas across LCAAP. Constituents included volatile semi-volatile organic chemicals, metals and explosives. The Area 18 operable unit (LCAAP-018) has several old burn pits/trenches contaminated with organics and metals, as well as a groundwater contamination plume. The Northeast Corner operable Unit (LCAAP-011,-016,-017) contains heavily contaminated oil and solvents pits; a 8.5-acre abandoned landfill with contaminated leachate seeps; a waste glass, paints and solvents area; and a (RCRA closed) metals-and explosives-contaminated burning ground. The Installation-Wide Operable Unit (remaining 31 AEDB-R sites) has a number of areas with surface and subsurface contamination, primarily metals and volatile organics.

Water from several of the plant's production/potable wells contains volatile organics in excess of drinking water standards. Air strippers to treat this problem were installed for three wells in January 1990 and for four additional wells in 1992.

Approximately eight off-post residential potable water wells north of Lake City were included in a quarterly monitoring program that was in operation from 1987 until October of 1993. Low-level explosive and volatile organic contamination has been sporadically detected in the residential wells, but levels remained below applicable criteria until recently. One sample containing TCE in December 1992, three samples containing cadmium in March 1993, and two samples containing lead in September 1993, were above Safe Drinking Water Standards. Eight off-post private wells were sampled in November 2002 and while low levels of metals were reported, no VOCs or explosives were detected in the private wells sampled.

In the fall of 1992, eight off-post groundwater monitoring wells were installed in strategic locations to intercept any contaminants that may migrate from LCAAP. The Comprehensive Groundwater Monitoring Program (GMP), which began in June 1994, continues to monitor CERCLA perimeter

IRP Contamination Assessment

wells on a biannual basis. Surface water locations and water supply wells are also sampled biannually as part of the GMP. In a letter from MDNR in April 2003, RCRA Subtitle C biannual monitoring was deferred to the CERCLA RI/FS program and RCRA Subtitle D monitoring was discontinued.

In 1996, Groundwater contaminated primarily with trichloroethylene and 1,2-dichloroethane was discovered at the northern LCAAP perimeter in Area 16. Off-post screening investigations on the Summers Property were performed in 2002. Results indicated that contaminants have migrated off-post. A time critical removal action (EW-2) was conducted to contain the contaminants.

The Area 18 pump and treat system (which began as a Removal Action) began operations in March 1997. The system became the object of a ROD in April of 1999, and continues to operate as part of the Final Remedy for the Area 18 Operable Unit. A multi-phase vapor extraction (MPVE) system and remediation of lead contaminated soil were also identified in the ROD. Data collected during design indicated that the plume extent was greater than originally defined. A design investigation was conducted which identified VOC plumes originating from AOCs 1 through 3 extending into the Lake City Aquifer. The design of the MPVE system was discontinued for further site characterization. Subsequent field investigations have yielded data that identifies the plume to be in excess of 10X the original size, and has identified other COCs in surface and near-surface soils (PCBs and PAHs). In 2003, the Army installed 28 additional monitoring wells and conducted two quarterly sample events to confirm the extent of VOC contamination. The removal contract to excavate and dispose of lead-contaminated soils was terminated due to the discovery of PCBs in surface and near surface soils adjacent to the source areas. The PBC contractor has executed additional characterization work. The contractor has also included a pilot test to demonstrate the In-situ Reductive Zone (enhanced bioremediation technology).

An Interim Remedial Action ROD was signed in September 1998 for installation of a permeable reactive barrier to treat groundwater from sources in the NECOU. The permeable reactive barrier (PRB) was installed between July 2000 and January 2001. Starting in March 2001 monitoring of the PRB was conducted on a quarterly basis to track the performance and effectiveness of the barrier. In December 2002 a hydrologic assessment of the PRB was conducted to evaluate the hydraulic conductivity and groundwater flow through and in the vicinity of the PRB. The assessment identified that groundwater was flowing around the PRB, but could not define whether contamination from the plume was redirected with the groundwater flow. In 2003, the Army conducted a plume delineation investigation to define the path of the plume post construction of the PRB.

Also as part of the Interim Remedial Action ROD for the NECOU, a soil cover was placed on the Oil and Solvent Pits (Area 17B). An Interim Removal Action for the repair of cover material and collection of leachate for the Abandoned Landfill (ABLF) is underway. In late 2003, an Explanation of Significant Difference (ESD) to the removal action was made available for public review and comment. The changes made proposed use of an engineered wetland for treatment of collected leachate rather than pumping to Building 163 for treatment. The change was predicated on the chemical analysis of the leachate. Cracks in the ABLF cover were repaired and two feet of compacted clay placed over the waste material. An additional one foot of vegetative cover soil was then placed followed by seeding. Collected leachate is stored in tanks prior to construction of

the wetland. Flow and chemical concentration data are being collected for input to the wetland design.

Additional monitoring wells were installed in the NECOU to better define groundwater quality, especially undefined source areas and bedrock contamination. The PBC contractor installed additional wells and performed sampling to eliminate data gaps. A pilot study is currently underway. A draft supplemental RI/FS has been prepared.

The Installation-Wide Operable Unit (IWOU) is in the Remedial Investigation/Feasibility Study phase. Characterization sampling has been completed. Sampling was completed in 2003 for Area 27 for the purposes of confirming the public health risk assessment prepared in the mid-1990s. Questions on the quality of the data used to prepare the earlier document required this reassessment. This work was funded by the Army Field Support Command. Characterization Sampling and treatability testing was completed on the Area 10 Sand Piles (also funded by the Army Field Support Command). An EE/CA has been prepared for the Sand Piles.

An EE/CA and draft Action Memorandum have been prepared for removal or cleaning of sumps (LCAAP-035). The removal action is scheduled to begin in the first half of 2006.

In September 2003 the Army awarded a Performance-Based Contract (PBC), Guaranteed Fixed Price Remediation (GFPR), to ARCADIS. The contract requires the PBC contractor to have remedies in place prior to October 2007. The PBC contractor has executed field Work Plans for all operable units and has updated the groundwater model for LCAAP. A Background Characterization Report and an update to the groundwater model have been completed. ARCADIS will complete execution of the Housekeeping removal action at five sites of the IWOU.

CLEANUP EXIT STRATEGY:

AREA 18:

- Finalize RI/FS Addendum
- Amend ROD
- Implement Remedial Actions
- Continue operation of remedial systems until MCLs or an impracticability decision is reached.
- Institute institutional controls.

NECOU:

- Complete RI addendum and pilot tests
- Complete FS and ROD
- Implement remedial actions
- Continue remedial actions and monitoring until MCLs are reached in Lake City aquifer or an impracticability decision is reached.
- Institute land use controls as necessary.

IWOU:

- Complete RI/FS, ROD
- Complete removal actions
- Implement remedial actions
- Institute land use controls.

1980

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1989

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1990

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1991

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- Final Remedial Investigation Report of the Northeast Corner Operable Unit at Lake City Army Ammunition Plant, Volume 1: Text, Volume 2: Appendices, USAEC, March 95
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1996

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- Draft Final Proposed Plan for the Area 18 Operable Unit, Independence, Missouri. Supplemental Assessment of Groundwater Contamination in the NECOU, Independence, Missouri, LCAAP, Nov-96

1997

- Engineering Evaluation/Cost Analysis, Non-Time-Critical Removal Action for the Area 16 Abandoned Landfill at the Northeast Corner Operable Unit, Independence, Missouri., LCAAP, Jan-97
- Landfarming Treatability Pilot Study Report, Independence, Missouri, LCAAP, Mar-97
- Draft Final Proposed Plan for the Area 18 Operable Unit, Independence, Missouri, LCAAP, Apr-97
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1998

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2002

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- Final Summary Report, Summers Property Groundwater Investigation, Lake City Ammunition Report, Independence, Missouri, LCAAP, Dec-02

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LAKE CITY ARMY AMMUNITION PLANT

Installation Restoration Program
Site Descriptions

NORTHEAST CORNER OPERABLE UNIT

SITE DESCRIPTION

The Northeast Corner Operable Unit is approximately 190 acres in size and is located in the northeast portion of the Installation. The majority of the NECOU source areas are situated in an upland area composed of clay and claystone. However, the western boundary of the OU is situated on an area of transition between the uplands and a lower-lying area under which the Lake City Aquifer is found. Within the NECOU, the Lake City Aquifer is located northwest of Buckner Road. This aquifer is an old stream channel beneath the ground surface consisting primarily of sand and gravel. The sand and gravel that make up this aquifer carry significant quantities of potable ground water.

The Northeast Corner Operable Unit (NECOU) comprises three of the 35 IRP Areas at LCAAP: Area 11 Burning Grounds (LCAAP-011), Area 16 Abandoned Landfill (LCAAP-016), and Area 17 Sanitary Landfill/Oil and Solvents Pits (LCAAP-017). There are 10 solid waste management units (SWMUs) within the three areas that have been used for a variety of waste disposal activities including landfilling of solid waste, industrial sludge, spent solvents, paints and oils and for open burning of explosives and other wastes. The SWMUs within the NECOU are identified as follows:

1. Area 11 - Burning Grounds (Closed RCRA site)
2. Area 16A - Abandoned Landfill (inactive)
3. Area 16B - Solvent Pits (inactive)
4. Area 16C - Firing Range (inactive)
5. Area 16D - Burning Grounds (inactive)
6. Area 17A - Current Landfill (permitted sanitary landfill but not currently being used)
7. Area 17B - Oil and Solvents Pits (inactive)
8. Area 17C - Burning Pad (inactive)
9. Area 17D - Waste, Glass, Paint, and Solvents Area (inactive)
10. Area 17E - Current Pistol Range (used for security force weapons training)

The Area 11 Burning Grounds was an area used for open burning of explosive compounds and pyrotechnics and has been closed under RCRA (for soil only). Area 16 includes the 8.7 acre Abandoned Landfill, solvent disposal pits, an inactive firing range, and burning grounds. Area 17 includes the Sanitary Landfill; three large oil and solvent disposal pits; a former burning pad; waste, glass, paint, and solvents disposal pits; and an active pistol range.

In addition to the 10 SWMUs, there are two RCRA areas and two other areas that are being addressed as part of the NECOU FS. The RCRA areas, the Paint and Waste Solvent Storage Facility in the Waste, Glass, Paint, and Solvents Area and the former Solvent and Oil Waste Tanks near the Abandoned Landfill have been incorporated into the overall CERCLA program at LCAAP via the FFA. The other two are referred to as the East Gate Plume and West ABLF Plume. The PBC contractor has completed fieldwork to provide information required for the Feasibility Study. Two monitoring wells have been installed on private property off the installation.

NORTHEAST CORNER OPERABLE UNIT (CONT.)

CLEANUP STRATEGY

- Continued operation of the extraction well 17-S with treatment at Building 163. (funded under LCAAP-018, Pump & Treat System).
- Complete pilot study of enhanced bioremediation
- Complete Feasibility Study.
- ROD will be signed.
- RD based on technologies selected.
- Construct engineered wetland for leachate collected from the ABLF
- RA(C)
- RA(O)

AREA 18 OPERABLE UNIT

SITE DESCRIPTION

Area 18 is located in the north-northeast portion of the installation and covers 167 acres. Eight surface impoundments existed in this area in the 1950s, in which Industrial Wastewater Treatment Plant (IWTP) waste grease and oil, solvents, and trash were burned. Fifteen additional pits used for burning and disposal of IWTP and other wastes were located throughout the area. A VOC plume lies in the groundwater beneath Area 18. A removal action (REM) to install a pump and treat system for the groundwater has been completed, and was expanded to include treatment of VOC-containing groundwater from the newly-constructed groundwater extraction well in Area 16.

Pre-design activities were started for a Multi-Phase Vacuum Extraction system to address organic contaminants in soil and in shallow groundwater. Data collected in support of the design activities discovered that the vertical and areal extent of the VOC contamination was greater than originally anticipated. A design investigation consisting of MIP/CPT data at 53 locations and discrete groundwater samples at 10 locations provided data that indicated that the proposed MPVE system may not be a viable option. The areal extent of the VOC plume is larger than originally known at the time of the ROD. The PBC contractor has completed characterization work and an in situ enhanced bioremediation pilot study (2005) and bench testing of zero-valent iron. A draft RI/FS addendum has been prepared.

CLEANUP STRATEGY

- Continued operation of GW pump and treat system (funded under LCAAP-018)
- Finalize the RI/FS Addendum
- ROD Amendment
- RD based on technologies selected
- RA(C)
- RA(O)

INSTALLATION-WIDE OPERABLE UNIT

SITE DESCRIPTION

The Installation-wide Operable Unit consists of 31 sites. Semi-annual groundwater monitoring is currently being conducted at the fence perimeter, off-site, and at selected on-post wells including water supply wells. The Army has updated the groundwater model to provide recommendations for the operation of the installations production Water Supply System and groundwater containment program.

Soils and groundwater are contaminated with metals, explosives, VOCs, and SVOCs. The Area 10 Sand Piles are contaminated with metals, depleted uranium (DU) and other ordnance-related contaminants.

The PBC contractor is completing the Remedial Investigation/Feasibility Study for the Operable Unit. Their work includes sampling and analyses of sumps in Area 13 and 15. The Army has completed sampling of the remaining sumps on the installation. All sumps are the subject of an EE/CA and draft Removal Action Memorandum. The PBC contractor prepared a Removal Action Memorandum for five sites in the IWOU, referred to as the “Housekeeping Sites.” The Area 10 Sand Piles are the subject of an Engineering Evaluation /Cost Analysis. The PBC contractor has prepared a Final Background Characterization Report for the installation (2005).

CLEANUP STRATEGY

The Army has initiated a comprehensive RI and BLRA (which includes a Human Health Risk Assessment and Ecological Risk Assessment) for the IWOU. The Risk Assessment will facilitate development of remedial objectives consistent with Army policies regarding future land-use.

A remedial action is planned to characterize, treat, and dispose Area 10 DU and lead contaminated soils (also referred to as the Sand Piles). An EE/CA has been completed. Due to funding issues, it is currently planned to make Area 10 its own operable unit. At that time, the remedial action would be conducted independently of the RI/FS for IWOU, however other AOIs in Area 10 outside of the Sand Piles will be addressed in the RI/FS. Army Field Support Command (AFSC) is managing this IRA.

In summary:

- Complete removal action for the “Housekeeping Sites”
- Complete RI/FS for the IWOU (with the exception of the Active Range in Area 27)
- Complete remedial actions for Area 10 Sand Piles
- Complete removal action for the Inactive Sumps
- ROD
- RD based on technologies selected
- RA(C)
- RA(O)

LCAAP-001

AREA 1-BUILDING 83 WASTEWATER LAGOONS

SITE DESCRIPTION

Neutralized wastewater from the production of Trinitroresorcinal (TNR) at Building 83 was discharged into lagoons. A total of five lagoons have operated intermittently in this area from 1941 through 1986. Four of the five lagoons were removed under an approved closure plan between 1986 and 1988. Soil sampling performed as part of the closure activities indicated that all of the soil remaining in the lagoon areas after closure passed EP Toxicity criteria for lead (the indicator parameter).

CLEANUP STRATEGY

Complete RI/FS and Risk Assessment to determine appropriate remedy.

For management and funding purposes, this site has been consolidated into the PBC (GFPR) under LCAAP-036. *For administrative purposes, this site was declared RC in AEDB-R in September 2000.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: High

CONTAMINANTS OF CONCERN:
Metals

MEDIA OF CONCERN: Soil,
Groundwater

Phases	Start	End
PA.....	197906	198901
SI	197906	198901
RI/FS	198708	200009

RC DATE: 200009*

AREA 2-BUILDING 85 WASTEWATER LAGOONS

SITE DESCRIPTION

This site covers an area of ~two acres. Neutralized wastewater from the production of lead-based initiating compounds (tetrazene, lead styphnate) at Building 85 was discharged into two large lagoons and one small lagoon. The lagoons operated intermittently in this area from about 1960 through 1988. The two large lagoons were removed in 1990 as part of an MDNR approved RCRA Closure. Soil sampling performed as part of the closure activities indicated that all of the soil remaining in the lagoon areas after closure passed EP Toxicity criteria for lead (the indicator parameter), and had acceptable levels of total lead, strontium, and aluminum. The original small lagoon contents have been removed in 2005.

CLEANUP STRATEGY

Complete RI/FS and Risk Assessment to determine additional remedies. Metals-contaminated soil still remains outside of the original small lagoon and is being addressed as part of the RI/FS.

For management and funding purposes, this site has been consolidated into the PBC (GFPR) under LCAAP-036. *For administrative purposes, this site was declared RC in AEDB-R in September 2000.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: High

CONTAMINANTS OF CONCERN:
Metals, Explosives

MEDIA OF CONCERN: Soil,
Groundwater, Surface Water

<u>Phases</u>	<u>Start</u>	<u>End</u>
PA.....	197906	198901
SI	197906	198901
RI/FS	198708	200009
IRA	198805	198910

RC DATE: 200009*

LCAAP-003
AREA 3-SAND PITS

SITE DESCRIPTION

A series of sand quarry pits (the sand was used as building foundation material) and small lagoons were used for disposal of Plant construction materials and demolition/remodeling debris, Industrial Wastewater Treatment Plant (IWTP) sludge, and some off-site material (from DOE Kansas City Plant). The area was used for disposal activities from about 1950 into the early 1970s.

Soil sampling in the area has shown elevated values of polyaromatic hydrocarbons (PAH), metals and explosives. SCAPS sampling in 1999 indicated no VOCs in groundwater above detection limits. Groundwater sampling has shown metal concentrations above screening levels.

CLEANUP STRATEGY

Complete RI/FS and Risk Assessment to determine appropriate remedy.

For management and funding purposes, this site has been consolidated into the PBC (GFPR) under LCAAP-036. *For administrative purposes, this site was declared RC in AEDB-R in September 2000.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: High

CONTAMINANTS OF CONCERN:
Metals, PAHs, Explosives

MEDIA OF CONCERN: Soil,
Groundwater, Surface Water

Phases	Start	End
PA.....	197906	198901
SI	197906	198901
RI/FS	198708	200009

RC DATE: 200009*

LCAAP-004

AREA 4-BUILDING 139 - BACKLINE PONDS

SITE DESCRIPTION

A series of small lagoons were used for disposal of wastewater from the neutralization of lead styphnate slurry, lead azide, primer mix, and RDX. The area was used for these disposal activities from 1941 until 1985. Two small lagoons also accepted chemical laboratory wastes consistent with the products being manufactured during the same time period. The wastewater lagoons were removed under an approved closure plan during the period 1985 to 1987. Soil sampling indicated the presence of metals above screening levels. Explosives compounds have also been detected in groundwater.

CLEANUP STRATEGY

Complete RI/FS and Risk Assessment to determine appropriate remedy.

For management and funding purposes, this site has been consolidated into the PBC (GFPR) under LCAAP-036. *For administrative purposes, this site was declared RC in AEDB-R in September 2000.

STATUS

REGUALTORY DRIVER: CERCLA

RRSE: High

CONTAMINANTS OF CONCERN:
Metals, Explosives

MEDIA OF CONCERN: Soil,
Groundwater, Surface Water

Phases	Start	End
PA	197906	198901
SI	197906	198901
RIFS	198708	200009

RC DATE: 200009*

AREA 5-BUILDING 139 IMPOUNDMENTS

SITE DESCRIPTION

Neutralized wastewater from the production and use of explosive compounds (TNR, RDX, PETN) at Building 139 was discharged into a lagoon. There were also solvent-cleaning and disposal activities in the area during the 1950s. The lagoon operated intermittently in this area from about 1941 through 1988. It was removed in 1990. Soil sampling performed as part of the closure activities indicated that all of the soil remaining in the lagoon areas after closure passed EP Toxicity criteria for lead (the indicator parameter. Sampling in 2004 indicates metals above screening criteria. Groundwater sampling indicates the presence of explosives, VOCs, and metals.

CLEANUP STRATEGY

Complete RI/FS and Risk Assessment to determine appropriate remedy.

For management and funding purposes, this site has been consolidated into the PBC (GFPR) under LCAAP-036. *For administrative purposes, this site was declared RC in AEDB-R in September 2000.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: Medium

CONTAMINANTS OF CONCERN:
Metals, VOCs, Explosives

MEDIA OF CONCERN: Soil,
Groundwater, Surface Water

<u>Phases</u>	<u>Start</u>	<u>End</u>
PA.....	197906	198901
SI	197906	198901
RI/FS	198708	200009

RC DATE: 200009*

LCAAP-006

AREA 6-BUILDING 65 IMPOUNDMENT

SITE DESCRIPTION

One lagoon was used for disposal of wastewater from the load/assemble/pack activities for 20MM ammunition. The area was used for these disposal activities from 1941 until the late 1970s. Contaminants included metals and explosives. The lagoon was removed under an approved MDNR closure in 1990. The indicator parameter for closure was Chemical Oxygen Demand less than or equal to 10 times background. There are also 2 small areas where pipe leaks have been reported in the past. Sampling revealed explosives in groundwater.

CLEANUP STRATEGY

Complete RI/FS and Risk Assessment to determine appropriate remedy.

For management and funding purposes, this site has been consolidated into the PBC (GFPR) under LCAAP-036. *For administrative purposes, this site was declared RC in AEDB-R in September 2000.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: Medium

CONTAMINANTS OF CONCERN:
Metals, Explosives

MEDIA OF CONCERN: Soil,
Groundwater, Surface Water

Phases	Start	End
PA.....	197906	198901
SI	197906	198901
RI/FS	198708	200009

RC DATE: 200009*

AREA 7-INDUSTRIAL WASTEWATER LAGOON AREA

SITE DESCRIPTION

Area 7 is located in the center of the installation, to the north of Ditch A. Nine unlined lagoons were used as settling basins for “finished” wastewater from the IWTP. The northern-most set of three lagoons became inactive and was covered in 1952 but never remediated. The two remaining sets of three lagoons were RCRA-closed in 1989. Historical activities and processes that have been documented in Area 7 have been the operation of an industrial wastewater treatment plant (IWTP) associated with a waste oil and grease operation and wastewater finishing lagoons. Sludge generated was designated as K046 hazardous waste. Other historical activities have been the collection and burning of waste solvents, operation of an explosives-burning ground and an explosives container cleanup area.

One set of closed lagoons was retrofitted with double liners and a leachate collection system. It currently accepts finished wastewater from the IWTP. Three active sludge drying beds in the southeast portion of Area 7 receive non-hazardous sludge from drinking water treatment activities.

Historic soil sampling has indicated metals, SVOCs, and PCBs in exceedance of Industrial PRG values. Metals, VOCs, and explosives have been detected in groundwater at Area 7. Metals have also been detected in surface water.

CLEANUP STRATEGY

Complete RI/FS and Risk Assessment to determine appropriate remedy.

For management and funding purposes, this site has been consolidated into the PBC (GFPR) under LCAAP-036. *For administrative purposes, this site was declared RC in AEDB-R in September 2004.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: Medium

CONTAMINANTS OF CONCERN:
Metals, VOCs, Explosives, PCBs

MEDIA OF CONCERN: Soil,
Groundwater, Surface Water

Phases	Start	End
PA	197906	198901
SI	197906	198901
RI/FS	198708	200408

RC DATE: 200409*

LCAAP-008

AREA 8-SOLID WASTE LANDFILL

SITE DESCRIPTION

Area 8 covers ~45 acres in the southwest corner of the installation. Four earth pits, two of which had engineered clay liners were used to dispose of sludge from the IWTP basins (Area 7). Two of these four pits are part of ongoing RCRA/CERCLA/MDNR overlapping jurisdiction. Five earth pits north and west of the IWTP disposal area were used to dispose of IWTP-related material, and to dispose of construction debris created by USACE during construction of the 'Big Ditch.' Three of the four IWTP sludge disposal pits (which are operated under a Landfill Permit from MDNR) are currently covered. The fourth pit was constructed, but never used. The remaining five disposal pits are covered.

Six AOIs have been identified in Area 8, which consist of four Sludge Disposal areas, one Oil & Grease Trench area (RCRA closed), and a Permitted MDNR landfill. The permitted landfill is not eligible for ER,A funding. The remaining five Area 8 AOIs received various non-hazardous materials including sludge and oil and grease from the Industrial Wastewater Treatment Plant (IWTP) and construction debris from the construction of the 'Big Ditch.' The disposal areas were used sporadically from the 1950s until 1994. Excavation of the ditch took place in the mid-1980s and construction activities may have impacted one or more of the disposal cells in the area.

Both soil and groundwater samples collected at several of the disposal pits contained elevated levels of metals (primarily lead) and a trace of explosives. Sampling in 2004 indicated metals above screening levels in soils and groundwater.

CLEANUP STRATEGY

Complete RI/FS and Risk Assessment to determine appropriate remedy.

For management and funding purposes, this site has been consolidated into the PBC (GFPR) under LCAAP-036. *For administrative purposes, this site was declared RC in AEDB-R in February 2005.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: High

CONTAMINANTS OF CONCERN:
Metals

MEDIA OF CONCERN: Soil,
Groundwater, Surface Water,
Sediment

Phases	Start	End
PA	197906	198901
SI	197906	198901
RI/FS	198708	200502

RC DATE: 200502

LCAAP-009

AREA 9-BUILDING 60 TREATMENT FACILITY

SITE DESCRIPTION

This area contains five in-ground tanks for treatment of mercurous nitrate generated from crack testing of small arms cartridges. It also contains a sludge drying bed for zinc cyanide sludge generated from chromium plating of steel cartridge cases. These units operated during the 1950s and 1960s.

This area was the subject of an RI/FS in 1990 as a separate Operable Unit. Based on the presence of metals and VOCs in the surface soils and explosives in groundwater, this site was incorporated into the IWOU. Recent sampling (2004) confirmed metal concentrations exceed screening levels in soils. VOCs in groundwater are isolated to two sump locations. No explosives were detected in groundwater or soils.

CLEANUP STRATEGY

Complete RI/FS and Risk Assessment to determine appropriate remedy.

For management and funding purposes, this site has been consolidated into the PBC (GFPR) under LCAAP-036. *For administrative purposes, this site was declared RC in AEDB-R in September 2000.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: Medium

CONTAMINANTS OF CONCERN:
Metals, VOCs, Explosives

MEDIA OF CONCERN: Soil,
Groundwater, Surface Water

Phases	Start	End
PA.....	197906	198901
SI	197906	198901
RI/FS	198708	200009

RC DATE: 200009*

LCAAP-011

AREA 11-BURNING GROUND

SITE DESCRIPTION

The burning grounds site (Area 11) is a RCRA-Closed facility formerly used for the open burning of propellants and waste pyrotechnics mixtures. Area 11 groundwater has been deferred to the CERCLA Program. Low levels of explosives and perchlorates have been detected in the groundwater. Additional investigation and remediation are covered under the NECOU.

CLEANUP STRATEGY

Complete RI Addendum, FS and Risk Assessment to determine appropriate remedy.

For management and funding purposes, this site has been consolidated into the PBC (GFPR) under LCAAP036. *For administrative purposes, this site was declared RC in AEDB-R in September 2000.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: Low

CONTAMINANTS OF CONCERN:
Explosives

MEDIA OF CONCERN:
Groundwater

Phases	Start	End
PA.....	197906	198901
SI	197906	198901
RI/FS	198708	200009

RC DATE: 200009*

LCAAP-012

AREA 12-LABORATORY WASTE LAGOON

SITE DESCRIPTION

Two lagoons were used during the late 1950s through the mid 1960s to dispose of liquid wastes from the LCAAP chemical and metallurgical laboratories located at Building 6. Chemical analyses from groundwater monitoring wells in Area 3 thought to be associated with the laboratory waste lagoons were responsible for LCAAP being placed on the National Priorities List. The LCAAP paint shop is located in the eastern part of this area of investigation, and a small flash disposal pit is located to the west.

Chemical Analyses from Water Supply Well 17AA contain consistent detections of VOCs. Additional groundwater monitoring and SCAPS data (on 250 foot centers) also had detections of VOCs. Sampling in 2004 revealed metals above screening levels in soil. VOCs and metals were detected above screening criteria in groundwater.

CLEANUP STRATEGY

Complete RI/FS and Risk Assessment to determine appropriate remedy.

For management and funding purposes, this site has been consolidated into the PBC (GFPR) under LCAAP-036. *For administrative purposes, this site was declared RC in AEDB-R in September 2002.

STATUS

REGULATORY DRIVER:
CERCLA

RRSE: Medium

CONTAMINANTS OF CONCERN:
Metals, VOCs, Explosives

MEDIA OF CONCERN: Soil,
Groundwater

<u>Phases</u>	<u>Start</u>	<u>End</u>
PA.....	197906	198901
SI	197906	198901

RC DATE: 200209*

LCAAP-013

AREA 13-BUILDING #35 DRAINAGE AREA

SITE DESCRIPTION

This area accepted washwater and wastewater containing sodium dichromate from metal parts manufacturing in Building 35. The water emptied into a drainage ditch. Also in the area are a small solvents disposal pit and a drum handling and storage area. Metals have been detected in soil above screening levels. Surface water samples revealed explosive and metal contamination. Groundwater samples showed VOCs at one monitoring well.

CLEANUP STRATEGY

Complete RI/FS and Risk Assessment to determine appropriate remedy.

For management and funding purposes, this site has been consolidated into the PBC (GFPR) under LCAAP-036. *For administrative purposes, this site was declared RC in AEDB-R in September 2000.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: High

CONTAMINANTS OF CONCERN:
Explosives, VOCs, Metals

MEDIA OF CONCERN: Soil,
Groundwater, Sediment, Surface
Water

Phases	Start	End
PA.....	197906	198901
SI	197906	198901
RI/FS	198708	200009

RC DATE: 200009*

LCAAP-014 AREA 14-TANK FARM

SITE DESCRIPTION

This area contains a burning ground that was used to dispose of wooden ammunition boxes. The area also contains an IWTP Sludge disposal area. The burning ground operated from 1951 through 1967. The sludge disposal area ceased operation in 1965. Soil samples revealed metal and isolated VOC contamination. Groundwater samples indicated exceedences for metals.

CLEANUP STRATEGY

Complete RI/FS and Risk Assessment to determine appropriate remedy.

For management and funding purposes, this site has been consolidated into the PBC (GFPR) under LCAAP-036. *For administrative purposes, this site was declared RC in AEDB-R in September 2000.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: Medium

CONTAMINANTS OF CONCERN:
Metals

MEDIA OF CONCERN: Soil,
Groundwater

Phases	Start	End
PA.....	197906	198901
SI	197906	198901
RI/FS	198708	200009

RC DATE: 200009*

LCAAP-015 AREA 15-TEMPORARY SURFACE IMPOUNDMENT

SITE DESCRIPTION

This area contains a temporary surface impoundment built to temporarily contain wastewater from Buildings 35, 90C and 90D during lift station repairs. The wastewater contained Listed K046 waste. Metals, particularly lead and antimony, have been detected at elevated levels in sludge. Sampling in 2004 revealed metals in groundwater above screening levels. The impoundment was removed in 2005.

CLEANUP STRATEGY

Document in the RI/FS and Risk Assessment no further action is required.

For management and funding purposes, this site has been consolidated into the PBC (GFPR) under LCAAP-036. *For administrative purposes, this site was declared RC in AEDB-R in September 2000.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: Medium

CONTAMINANTS OF CONCERN:
Metals

MEDIA OF CONCERN: Soil,
Groundwater

Phases	Start	End
PA.....	197906	198901
SI	197906	198901
RI/FS	198708	200009

RC DATE: 200009*

LCAAP-016

AREA 16-ABANDONED LANDFILL

(PAGE 1 OF 2)

SITE DESCRIPTION

Area 16 is one Area included in the Northeast Corner Operable Unit.

LCAAP-016 contains the following Solid Waste Management Units:

Area 16A - An abandoned solid waste landfill which accepted Plant-generated industrial/construction waste from 1970 through 1979.

Area 16B - Several small trenches which received solvents during the 1950s.

Area 16C - A pistol range (closed), which the LCAAP security force used from 1952 through 1963.

Area 16D - An open burning ground which was operated from 1952 through 1957.

RCRA (A) - An area where five aboveground waste oil and solvents tanks were operated from 1980 through 1982.

RCRA (B) - A drum storage area which operated from 1979 until 1982, the RCRA solvents trenches and the above-ground tanks staging areas are both collocated RCRA Sites that are being addressed as part of the CERCLA Program per the FFA.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: High

CONTAMINANTS OF CONCERN:
Explosives, Solvents, Metals, PAHs, PBC

MEDIA OF CONCERN: Soil,
Groundwater, Surface Water

Phases	Start	End
PA.....	197906	198901
SI	197906	198901
RI/FS	198708	200409
IRA.....	199708	200506
RA(C).....	200506	200709
RA(O)	200506	200709

RC DATE: 200709

Note: Status box reflects ABLF Status (Removal Action). Remainder of Area 16 is included under PBC (LCAAP-036).

Data analysis for Area 16 reveals soil contamination with metals and VOC above screening levels. Groundwater samples in 2003 revealed VOC, PCB, 1,4-Dioxane, PAH and explosives above screening criteria.

The Action Memorandum for the Non-Time-Critical Removal Action for the Area 16A Abandoned Landfill was signed in June 2001. A Removal Action Management Plan was developed for the installation of a leachate collection system and cover at the Area 16A Abandoned Landfill in August 2001. An ESD was prepared and approved in FY04 that proposed the engineered wetlands for the treatment of leachate. Installation of soil cover and monitoring wells was completed in FY04. The wetland construction was deferred due to new seep discovered north of landfill. Additional information is required to determine if the new seep represents a threat to human health or the environment. The leachate from the landfill and the water in the new seep will be collected in concrete tanks for sampling and disposal pending integration of the wetland into the NECOU remedies. This work is funded under LCAAP-016.

LCAAP-016

AREA 16-ABANDONED LANDFILL

(PAGE 2 OF 2)

CLEANUP STRATEGY

ABLF (16A): Collection and treatment of leachate and seep water by ATK until remedies constructed for the remainder of the operable unit by the PBC.

Complete the RI Addendum, FS and ROD. Implement remedies and operate and monitor remedies under PBC.

AREA 17-SANITARY LANDFILL & SOLVENT PITS

SITE DESCRIPTION

This area contains the following Solid Waste Management Units that are potential source areas for the contamination found in the NECOU:

1. **Area 17A** - A permitted Sanitary Landfill that operated from 1980 to 1996.
2. **Area 17B** - Three Oil and Solvents Pits that received IWTP oil and grease, waste solvents, and waste oil from 1960 until 1979. Subsequently, a soil cover has been constructed above these pits. The source of contamination in the East Gate Plume has been traced back to the Oil and Solvents Pits.
3. **Area 17C** - An area where waste glass, paint, and solvents were buried in shallow pits and a stream bed. This area was active from 1960 through 1970.
4. **Area 17D** - An open burning pad which operated for a short time during 1975.
5. **Area 17E** - A pistol range that is currently used by the LCAAP security force. It has been in use since 1979.

The Oil and Solvent Pits and the Waste Glass, Paint and Solvent Pits are two of the most VOC-contaminated sites on Plant. Investigations (part of an expanded FS activity) are ongoing to further delineate areas of VOC, metals, and explosives contamination so those areas can be properly screened during the preparation of the FS.

In accordance with the Interim Action ROD signed in September 1998 a Permeable Reactive Barrier (PRB) was installed in July 2000 to prevent VOC contaminants from entering the Lake City Aquifer. The PRB is not performing as intended.

CLEANUP STRATEGY

Evaluation of the PRB and the surrounding area will determine possible augmentations, if any, that may be performed to meet remedial action objectives. Performance of the PRB will be considered in the remedy selection process.

Complete the RI Addendum, FS and the enhanced bioremediation pilot studies.

For management and funding purposes, this site has been consolidated into the PBC (GFPR) under LCAAP-036.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: High

CONTAMINANTS OF CONCERN:
Explosives, Solvents, Metals

MEDIA OF CONCERN: Soil,
Groundwater, Surface Water

Phases	Start	End
PA.....	197906	198901
SI	197906	198901
RI/FS	198708	200505
RD	200308	200509
IRA	199708	200309
RA(C)	200308	200509

RC DATE: 200509

AREA 18-BURNING PITS, LAGOONS & TRENCHES

SITE DESCRIPTION

This area contains the following Solid Waste Management Units being addressed under the PBC:

1. A central area of burn pits located along Ditch B. The pits were used to burn Plant construction debris and solvents. The pits were operated from 1952 through 1975.
2. Surrounding the central burn pit area are a number of smaller pits, trenches, and lagoons which accepted solvents, IWTP oil and grease, and other Plant-generated industrial wastes. These pits were used intermittently from 1952 through 1975. Several pits in this group contain extremely high levels of NAPL and PCBs. A strong natural attenuation process appears to be occurring, such that dissolved phase concentrations are significantly reduced within a short distance from the source areas. Two successful bench tests (enhanced bioremediation, chemical oxidation) significantly reduced residual concentrations further.
3. Metals/PCB-containing material has been spread in a thin layer over the ground in the area of the pits. This activity is believed to have been part of the pit capping operations taking place during 1975.

The following activity is non-PBC: A pump and treat system consisting of a former Water Supply Well (17FF), two Water Extraction Wells (17R and 17S), and a treatment system located in Building 163 were installed and officially began operation in April 1997. It is containing the groundwater plume. It was designed and constructed as a Removal Action; but, with the signing of the Area 18 ROD in April 1999, it has become part of the Final Remedy for the Area 18 Operable Unit.

The selected alternative in the ROD which includes Multi-Phase Vacuum Extraction System to remove source materials and removal of lead-contaminated soils was designed but not implemented. Data collected in support of the MPVE system indicated that VOC contamination extended both vertically and areally further than anticipated. Field investigations have been completed to characterize the nature and extent of the contamination. In 2005, a pilot test focusing on enhanced bioremediation and a bench test were completed. A draft RI/FS addendum was prepared in 2005.

CLEANUP STRATEGY

Finalize RI/FS Addendum followed by a ROD amendment.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: High

CONTAMINANTS OF CONCERN:
Solvents, Metals, PCBs, SVOCs

MEDIA OF CONCERN: Soil,
Groundwater

Phases	Start	End
PA.....	197906.....	198901
SI.....	197906.....	198901
RI/FS	198708.....	200408
RD	199706.....	200409
IRA	199307	200708
RA(C)	200708.....	200709
RA(O)	200709.....	203709

RIP DATE: 200709

RC DATE: 203709

LCAAP-019

AREA 19-BUILDING 1 VICINITY

SITE DESCRIPTION

This area comprises the grounds around and adjacent to Building 1. Several sumps are located around Building 1. A transformer pad at Building 5 and a former pole yard at Building 12A are also potential contaminant locations. Sampling in 2004 indicate metal, PCB, PAH and VOC contamination in soil and PAH and VOC contamination of groundwater.

CLEANUP STRATEGY

Complete RI/FS and Risk Assessment to determine appropriate remedy.

For management and funding purposes, this site has been consolidated into the PBC (GFPR) under LCAAP-036. *For administrative purposes, this site was declared RC in AEDB-R in September 2000.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: Low

CONTAMINANTS OF CONCERN:
Metals, VOCs, PAHs, PCBs

MEDIA OF CONCERN: Soil,
Groundwater

Phases	Start	End
PA	197906	198901
SI	197906	198901
RI/FS	198708	200009

RC DATE: 200009*

LCAAP-020

AREA 20-BUILDING 2 VICINITY

SITE DESCRIPTION

This area comprises the grounds around and adjacent to Building 2. Solvents were reported spilled in an area south of Building 14 (garage). The date of the spill and the quantity of material spilled is unknown.

Soil sampling in the area indicated no traces of VOCs, but arsenic and mercury were detected above background values. Sampling in 2004 revealed VOC contamination above screening levels in groundwater, and metals contamination above screening levels in soils.

CLEANUP STRATEGY

Complete RI/FS and Risk Assessment to determine appropriate remedy.

For management and funding purposes, this site has been consolidated into the PBC (GFPR) under LCAAP-036. *For administrative purposes, this site was declared RC in AEDB-R in September 2000.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: Medium

CONTAMINANTS OF CONCERN:
Metals, VOCs

MEDIA OF CONCERN: Soil
Groundwater

<u>Phases</u>	<u>Start</u>	<u>End</u>
PA.....	197906	198901
SI	197906	198901
RI/FS	198708	200009

RC DATE: 200009*

LCAAP-021

AREA 21-BUILDING 3 VICINITY

SITE DESCRIPTION

This area comprises the grounds around and adjacent to Building 3. This area also includes Buildings 3A and 12A, which were used during the 1960s for the machining and assembly of Depleted Uranium-containing .50 caliber and 20mm ammunition. Buildings 3A and 12A were decontaminated during 1985 and 1986. Subsequent inspection by Nuclear Regulatory Agency indicated that additional cleanup activities were required for Building 3A.

In July of 2001, the Army conducted a removal action to demolish and dispose of contaminated debris from Building 3A. In addition, three sumps were removed and disposed at a permitted disposal facility. Chemical and radiological confirmation samples were collected to verify that remaining soils do not exceed regulated levels of contaminants prior to backfilling of excavation areas. Sampling in 2004 revealed metal concentrations in soil above screening levels.

CLEANUP STRATEGY

Complete RI/FS and Risk Assessment to determine appropriate remedy.

For management and funding purposes, this site has been consolidated into the PBC (GFPR) under LCAAP-036. *For administrative purposes, this site was declared RC in AEDB-R in September 2000.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: Low

CONTAMINANTS OF CONCERN:
Metals

MEDIA OF CONCERN: Soil,
Groundwater, Surface Water

Phases	Start	End
PA.....	197906	198901
SI	197906	198901
RI/FS	198708	200009

RC DATE: 200009*

LCAAP-022

AREA 22-DEMOLITION - WASTE DUMP

SITE DESCRIPTION

This area contains a demolition waste dump which is thought to have been active during the 1940s and, perhaps, the early 1950s. The exact operating dates and the characteristics of the wastes the dump received are unknown. Results of the Remedial Investigation indicate metal concentrations in soils, surface water and groundwater above screening levels.

CLEANUP STRATEGY

Complete RI/FS and Risk Assessment to determine appropriate remedy.

For management and funding purposes, this site has been consolidated into the PBC (GFPR) under LCAAP-036. *For administrative purposes, this site was declared RC in AEDB-R in September 2000.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: Medium

CONTAMINANTS OF CONCERN:
Metals

MEDIA OF CONCERN: Soil
Groundwater, Surface Water

<u>Phases</u>	<u>Start</u>	<u>End</u>
PA.....	197906	198901
SI	197906	198901
RI/FS	198708	200009

RC DATE: 200009*

LCAAP-023

AREA 23-SLUDGE BURIAL PITS

SITE DESCRIPTION

This area contains four IWTP sludge burial pits. The pits were operated during the mid 1960s, and ceased operation in 1967. Soil samples collected in 2004 indicate metals and isolated PCB and VOC concentrations above screening levels.

CLEANUP STRATEGY

Complete RI/FS and Risk Assessment to determine appropriate remedy.

For management and funding purposes, this site has been consolidated into the PBC (GFPR) under LCAAP-036. *For administrative purposes, this site was declared RC in AEDB-R in September 2000.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: Medium

CONTAMINANTS OF CONCERN:
Metals, VOCs, PCB

MEDIA OF CONCERN: Soil,

Phases	Start	End
PA	197906	198901
SI	197906	198901
RI	198708	200009

RC DATE: 200009*

LCAAP-024

AREA 24-SANITARY WASTEWATER TRTMNT PLANT

SITE DESCRIPTION

This area is the site of the now-inactive Sanitary Wastewater Treatment Plant. The Plant operated from 1941 until the industrial wastewater and sanitary wastewater streams were combined to go to Little Blue Valley Sewer District in 1990. Sampling in 2004 revealed metals and VOCs above screening levels in groundwater and metals above screening levels in soil.

CLEANUP STRATEGY

Complete RI/FS and Risk Assessment to determine appropriate remedy.

For management and funding purposes, this site has been consolidated into the PBC (GFPR) under LCAAP-036. *For administrative purposes, this site was declared RC in AEDB-R in September 2000.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: Low

CONTAMINANTS OF CONCERN:
Metals, VOCs

MEDIA OF CONCERN: Soil
Groundwater, Surface Water

PHASES	Start	End
PA	197906	198901
SI	197906	198901
RI	198708	200009

RC DATE: 200009*

LCAAP-025

AREA 25-DEMOLITION WASTE DUMP

SITE DESCRIPTION

This area contains a disposal area which received transite asbestos wastes from Plant construction activities. The transite material is spread out on the ground and was put into a ditch at the dump location. The date when the material was disposed is unknown. Sampling in 1998 indicated metals in sediment exceeded PRG screening levels. In 2005 the wastes were removed as part of the Housekeeping Removal Action.

CLEANUP STRATEGY

Document the removal action in the RI/FS.

For management and funding purposes, this site has been consolidated into the PBC (GFPR) under LCAAP-036. *For administrative purposes, this site was declared RC in AEDB-R in September 2000.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: Low

CONTAMINANTS OF CONCERN:
Asbestos, Metals

MEDIA OF CONCERN: Sediment,
Surface Water

Phases	Start	End
PA.....	197906	198901
SI	197906	198901
RI/FS	198708	200009

RC DATE: 200009*

LCAAP-026

AREA 26-DEMOLITION DUMP

SITE DESCRIPTION

This area contains a disposal area which received roofing material from Plant construction activities. The material is spread out on the ground and was put into a ditch at the dump location. The date when the material was disposed is unknown.

Soil samples (1992) from the area indicated the presence of Poly Aromatic Hydrocarbons (PAH) (from roofing tar) and metals at levels above screening levels. The waste materials were removed in 2005 as part of the Housekeeping Removal Action.

CLEANUP STRATEGY

Site Closure will be documented in the RI/FS and IWOU ROD.

For management and funding purposes, this site has been consolidated into the PBC (GFPR) under LCAAP-036. *For administrative purposes, this site was declared RC in AEDB-R in September 2000.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: Low

CONTAMINANTS OF CONCERN:
Metals, PAHs

MEDIA OF CONCERN: Soil
Groundwater, Surface Water,
Sediment

Phases	Start	End
PA	197906	198901
SI	197906	198901
RI/FS	198708	200009

RC DATE: 200009*

LCAAP-028 AREA 28-PIPELINE LEAKS

SITE DESCRIPTION

This area comprises a petroleum pipeline leak that was reported to have occurred during the 1950s. One soil sample collected in 2004/2005 indicated VOC (benzene) concentration above screening levels.

CLEANUP STRATEGY

Complete RI/FS and Risk Assessment to determine appropriate remedy, if any.

For management and funding purposes, this site has been consolidated into the PBC (GFPR) under LCAAP-036. *For administrative purposes, this site was declared RC in AEDB-R in March 2000.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: Low

CONTAMINANTS OF CONCERN:
VOCs

MEDIA OF CONCERN: Soil
Groundwater, Surface Water

Phases	Start	End
PA.....	197906	198901
SI	197906	198901
RI/FS	198708	200003

RC DATE: 200003*

LCAAP-029 AREA 29-WESTERN BORDER DUMPS

SITE DESCRIPTION

This area contains two dumps situated along the western boundary of the Plant. The northern dump reportedly received debris from the original Plant construction activities. The southern dump was used during construction of the Big Ditch (from 1984 through 1987).

Soil borings indicated metals values above screening values. Groundwater data indicate metal concentrations above screening levels.

CLEANUP STRATEGY

Complete RI/FS and Risk Assessment to determine appropriate remedy, if any.

For management and funding purposes, this site has been consolidated into the PBC (GFPR) under LCAAP-036. *For administrative purposes, this site was declared RC in AEDB-R in September 2000.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: High

CONTAMINANTS OF CONCERN:
Metals

MEDIA OF CONCERN: Soil,
Surface Water, Groundwater

Phases	Start	End
PA	197906	198901
SI	197906	198901
RI/FS	198708	200009

RC DATE: 200009*

AREA 30-BURNING PITS ASH DISPOSAL

SITE DESCRIPTION

This area was used to burn wooden ammunition boxes from 1951 to 1967. The area has also accepted broken glassware and debris from the Plant chemical laboratories.

A variety of VOCs, metals, and explosives have been detected in the area at concentrations above background levels. In particular, the concentration of metals is among the highest concentrations detected at the plant. Soil samples analyzed in 2004 indicate metal, explosives and VOC concentrations above screening levels. Monitoring Well 30MW03 had a sample that exceeded metals screening values for manganese. Surface water samples exceeded screening values for metals.

CLEANUP STRATEGY

Complete RI/FS and Risk Assessment to determine appropriate remedy.

For management and funding purposes, this site has been consolidated into the PBC (GFPR) under LCAAP-036. *For administrative purposes, this site was declared RC in AEDB-R in September 2000.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: High

CONTAMINANTS OF CONCERN:
Explosives, Metals, VOCs

MEDIA OF CONCERN: Soil
Groundwater, Surface Water

Phases	Start	End
PA.....	197906	198901
SI	197906	198901
RI/FS	198708	200009

RC DATE: 200009*

LCAAP-031

AREA 31-FIREBREAK LANDFILLS

SITE DESCRIPTION

This area contains two dumps. They are the remnants of dumping in shallow open pits across a broad U-shaped area. The waste is assorted household debris, empty drums, and empty ammunition boxes. There is also evidence of some burning in the area. The area was probably sporadically active during the 1940s through 1960s. Some material may also have been added after that time.

A variety of poly aromatic hydrocarbons (PAH) (from roofing tar and shingles), metals, and explosives have been detected in the area at concentrations above background levels. Lead, antimony, and arsenic were detected at elevated levels. During the removal of wastes in 2005 (Housekeeping Removal Action) MEC was encountered, resulting in a delay of the completion of the removal action.

CLEANUP STRATEGY

Complete the removal action for the debris disposal area. Site Closure will be documented in the RI/FS and the IWOU ROD.

For management and funding purposes, this site has been consolidated into the PBC (GFPR) under LCAAP-036. *For administrative purposes, this site was declared RC in AEDB-R in September 2000.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: High

CONTAMINANTS OF CONCERN:
Metals, PAHs, Explosives

MEDIA OF CONCERN: Soil,
Surface Water, Groundwater

Phases	Start	End
PA	197906.....	198901
SI.....	197906.....	198901
RI/FS.....	198708.....	200009

RC DATE: 200009*

LCAAP-032

AREA 32-HOUSE BASEMENT

SITE DESCRIPTION

Scattered throughout the wooded area of the Plant are the remnants of several houses that existed prior to 1940 when the Installation was founded. A survey of the area revealed five intact houses or house basements. One of the basements contained empty drums and a tarry residue. Another one had a domestic waste dump adjacent to the foundation.

The empty drums have been removed, and the tarry material has been sampled and tested. Soil sampling was also performed at the domestic waste dump. It indicated elevated values for lead and for one of the PAHs. One soil sample collected in 2004 revealed arsenic concentrations above screening criteria.

CLEANUP STRATEGY

Complete the RI/FS and Risk Assessment to determine appropriate remedy, if any.

For management and funding purposes, this site has been consolidated into the PBC (GFPR) under LCAAP-036. *For administrative purposes, this site was declared RC in AEDB-R in September 2000.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: Low

CONTAMINANTS OF CONCERN:
Metals, PAHs

MEDIA OF CONCERN:
Groundwater

Phases	Start	End
PA.....	197906	198901
SI	197906	198901
RI/FS	198708	200009

RC DATE: 200009*

LCAAP-033

AREA 33-BLENDING PELLETIZING

SITE DESCRIPTION

This site is located in the center of the facility and contains a series of small buildings with blast-deflector berms. Some of these structures were used in powder pouring operations which were conducted to scale-down bulk quantities of propellant. Other buildings were used to support operations in the former Fuze Line Area through the pelletizing of RDX. The three sumps in this area received wash-down water during operations but are presently inactive. Drains leading to the sumps were cemented closed in the 1970s. Sampling in 2004 and 2005 indicated PAHs and metals (arsenic) concentrations in soil exceeded screening levels. One groundwater sample beneath one sump indicated an exceedance of screening values for explosives (RDX).

CLEANUP STRATEGY

Complete the RI/FS and Risk Assessment to determine appropriate remedy.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: Low

CONTAMINANTS OF CONCERN:
Metals, PAHs, Explosives

MEDIA OF CONCERN: Soil,
Surface Water, Groundwater

<u>Phases</u>	<u>Start</u>	<u>End</u>
PA.....	197906	198901
SI	197906	198901
RI/FS	198708	200009

RC DATE: 200009*

*For administrative purposes, this site was declared RC in AEDB-R in September 2000.

LCAAP-034

AREA 34-SITE DITCHES

SITE DESCRIPTION

Plant-wide surface water not otherwise addressed is covered under this site.

Ditch A is the channelized remnant of West Fire Prairie Creek. It provides storm water/runoff drainage for the western half of the Plant. Prior to 1990, Ditch A was the outfall receiver for the Industrial Wastewater Treatment Plant and for the Sanitary Sewage Plant. Sumps are also located in Area 33.

Ditch B is the channelized remnant of East Fire Prairie Creek. It provides storm water/runoff drainage for the eastern half of the Plant. Ditch A was the receiver for runoff from the firing range, the Building 139 Fuze Manufacturing Area, and from several of the Plant's main production and warehouse buildings. It also runs through Area 18 and the Northeast Corner Operable Unit. Previous surface water and sediment sampling have indicated sporadic detections of VOCs and explosives. Sampling performed in 2004 indicated metals, PAHs, PCBs and explosive concentrations above screening levels in soil and sediment. PAHs, Metals and SVOCs were detected at concentrations above screening levels in surface water.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: Low

CONTAMINANTS OF CONCERN:
Metals, PAHs, SVOCs, PCBs,
Explosives

MEDIA OF CONCERN:
Surface Water, Sediment

<u>Phases</u>	<u>Start</u>	<u>End</u>
PA.....	197906198901
SI	197906198901
RI/FS	198708200009

RC DATE: 200009*

CLEANUP STRATEGY

Complete the RI/FS and Risk Assessment to determine appropriate remedy. For management and funding purposes, this site has been consolidated into the PBC (GFPR) under LCAAP-036.

*For administrative purposes, this site was declared RC in AEDB-R in September 2000.

SITE DESCRIPTION

This is an administrative AEDB-R Area created for financial management of the Performance-Based Contract. The scope of work is “Remedies in Place” for all operable units by the end of FY07, and five years of operation and monitoring and completion of a ROD five-year review by FY12.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: Low

CONTAMINANTS OF CONCERN:
Metals, PAHs, Explosives, VOCs, SVOCs

MEDIA OF CONCERN: Soil,
Surface Water, Groundwater

Phases	Start	End
PA.....	197906	198901
RA(C)	200309	200709
RA(O)	200709	201209

RIP DATE: 200709

RC DATE: 201209

**LAKE CITY ARMY
AMMUNITION PLANT
INSTALLATION RESTORATION
PROGRAM
SITE DESCRIPTIONS
(Sites not included in the PBC)**

LCAAP-010

AREA 10-FIRING RANGE WASTE DUMP

SITE DESCRIPTION

This area, known generically as the Sand Piles, contains waste sand from the backstops at the outdoor firing range. Ammunition produced at the Plant (and additional quality control rounds) is fired into sand backstops. During the 1960s, depleted uranium rounds were demilitarized by firing them into a sand backstop. From the early 1950s through the late 1970s, sand and bullet material were periodically removed from the backstops and disposed of in Area 10. The debris from the depleted uranium demilitarization effort was included in the material disposed of in Area 10. Sampling to identify additional contaminants of concern was performed in 2004. Lead, MEC and DU are the contaminants of concern. In February 2005 additional testing was performed for treatability and MEC identification purposes.

A Final EE/CA has been completed. Because of funding schedule, this site is planned to be designated as a separate operable unit.

CLEANUP STRATEGY

Remove the Sand Piles. This is a joint effort by LCAAP/ER,A and Army Field Support Command (Radiation Safety Office). Prepare RI/FS post removal and ROD.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: Low

CONTAMINANTS OF CONCERN:
Metals, MEC, Depleted Uranium

MEDIA OF CONCERN: Soil
Groundwater, Surface Water

Phases	Start	End
PA.....	197906	198901
SI	197906	198901
RI/FS	198708	200309
IRA	200601	200609
RA(C)	200610	200809

RC DATE: 200809

LCAAP-027
AREA 27-FIRING RANGE

SITE DESCRIPTION

The firing range has been in operation since the early 1950s to test all of the types of ammunition produced at LCAAP for function and accuracy. In addition to the “main” 2,600-yard range, tracer bullets were tested until the 1950s at the “Tracer Range” south of Building 45. Depleted uranium-containing rounds were tested at the 600-yard bullet trap and at impact areas along the range from the late 1950s until 1978.

At Areas 27A and 27B, the Army has collected soil samples and performed radiological screening within these areas as part of the NRC decommissioning program to identify radioactive materials (depleted uranium) within the area. The Army conducted the removal of radiologically contaminated soils from the 600-yard bullet catcher in 2001 (Area 10 Sand Piles). This removal action was conducted under the decommissioning requirements imposed by NRC.

The Army Field Support Command conducted a Risk Evaluation of the Area 27 A and B impact areas. No RI/FS activities will be completed until the closure of the range.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: Low

CONTAMINANTS OF CONCERN:
Asbestos, Metals, Depleted Uranium

MEDIA OF CONCERN: Sediment, Surface Water

Phases	Start	End
PA.....	197906	198901
SI	197906	198901
RI/FS	198708	198901

RC DATE: 198901

LCAAP-035 AREA 35-SUMPS

SITE DESCRIPTION

Site contains ~127 inactive sumps located within the plant. The Army believes that these sumps and their associated piping are potential source areas and are integral to the investigation of soil and groundwater media. All the sumps in LCAAP-013 and LCAAP-015 will be addressed under PBC. The remaining sumps are addressed under AEDB-R site LCAAP-035. In 2004 and early 2005 sampling was completed at all sumps, associated piping and pipe outfalls. Soil and groundwater samples were collected. In 2005 a Final EE/CA was completed.

CLEANUP STRATEGY

Based on the sampling analytical results, the sumps, their contents, and the associated piping will be abandoned, or removed and disposed appropriately via a removal action. Six sumps are scheduled for removal.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: High

CONTAMINANTS OF CONCERN:
Metals, PCBs, Explosives, VOCs

MEDIA OF CONCERN: Soil,
Groundwater, Surface Water

Phases	Start	End
PA.....	197906	198901
SI	197906	198901
RI/FS	198708	200409
IRA.....	200405	200609
RA(C).....	200405	200609

RC DATE: 200609

IRP NO FURTHER ACTION SITES SUMMARY

AEDB-R #	Site Title	Documentation/ Reason for RC	RC Date
LCAAP-001	AREA 1 – BUILDING 83 WASTEWATER LAGOONS	OTHER	200009
LCAAP-002	AREA 2 - BUILDING 85 WASTEWATER LAGOONS	OTHER	200009
LCAAP-003	AREA 3 – SANDPITS	OTHER	200009
LCAAP-004	AREA 4 – BUILDING 139 – BACKLINE PONDS	OTHER	200009
LCAAP-005	AREA 5 – BUILDING 139 IMPOUNDMENTS	OTHER	200009
LCAAP-006	AREA 6 – BUILDING 65 IMPOUNDMENT	OTHER	200009
LCAAP-007	AREA 7 – INDUSTRIAL WASTEWATER LAGOON AREA	OTHER	200409
LCAAP-008	AREA 8 – SOLID WASTE LANDFILL	OTHER	200502
LCAAP-009	AREA 9 – BUILDING 60 TREATMENT FACILITY	OTHER	200009
LCAAP-011	AREA 11 – BURNING GROUND	OTHER	200009
LCAAP-012	AREA 12 – LABORATORY WASTE LAGOON	OTHER	200209
LCAAP-013	AREA 13 – BUILDING #35 DRAINAGE AREA	OTHER	200009
LCAAP-014	AREA 14 – TANK FARM	OTHER	200009
LCAAP-015	AREA 15 – TEMPORARY SURFACE IMPOUNDMENT	OTHER	200009
LCAAP-017	AREA 17-SANITARY LANDFILL & SOLVENT PITS	All Required Cleanup(s) Completed	200509
LCAAP-019	AREA 19 – BUILDING 1 VICINITY	OTHER	200009
LCAAP-020	AREA 20 – BUILDING 2 VICINITY	OTHER	200009
LCAAP-021	AREA 21 – BUILDING 3 VICINITY	OTHER	200009
LCAAP-022	AREA 22 – DEMOLITION – WASTE DUMP	OTHER	200009
LCAAP-023	AREA 23 – SLUDGE BURIAL PITS	OTHER	200009
LCAAP-024	AREA 24 – SANITARY WASTEWATER TRTMNT PLANT	OTHER	200009
LCAAP-025	AREA 25 – DEMOLITION WASTE DUMP	OTHER	200009
LCAAP-026	AREA 26 – DEMOLITION DUMP	OTHER	200009
LCAAP-027	AREA 27 - FIRING RANGE	Not Eligible For ER,A/ BRAC Funding	198901
LCAAP-028	AREA 28 – PIPELINE LEAKS	OTHER	200003
LCAAP-029	AREA 29 – WESTERN BORDER DUMPS	OTHER	200009
LCAAP-030	AREA 30 – BURNING PITS ASH DISPOSAL	OTHER	200009
LCAAP-031	AREA 31 – FIREBREAK LANDFILLS	OTHER	200009
LCAAP-032	AREA 32 – HOUSE BASEMENT	OTHER	200009
LCAAP-033	AREA 33 – BLENDING PELLETIZING	OTHER	200009
LCAAP-034	AREA 34, SITE DITCHES	OTHER	200009

Initiation of IRP: 1980

Past Phase Completion Milestones

1980

- Installation Assessment May

1987-1990

- REM (Close 25 Lagoons)

1988

- Phase I RI/FS Fieldwork Aug

1989

- PA/SI Jan

1990

- Phase IIa RI Fieldwork Sep

1992

- Phase IIb RI Fieldwork Dec

1990-1992

- Install 6 Air Strippers

1993

- Draft I-W RI Oct

1995

- Area 18 RI March

1996

- Area 18 FS March
- NECOU RI March
- Draft NECOU FS: June

1997

- Area 18 Proposed Plan April

1998

- Final NECOU Interim Action ROD September

1999

- Final Area 18 ROD April
- NECOU IRA draft ramp December

2001

- Area 18 Draft WP May
- Area 16 Draft-Final IRA Report July
- Area 18 Draft-Final Lead Spec. August
- Area 16 Draft-Final Ramp August

2002

- Area 16 Final IRA Construction Summary Report December

2005

- IWOU "Housekeeping Sites" Removal Action Memorandum March

Projected Record of Decision (ROD)/Decision Document (DD) Approval Dates: 2007

Projected Construction Completion Date of IRP and Removal from NPL: 2007 & 2012

Schedule for Next Five Year Review: 2010

Estimated Completion Date of IRP (including LTM phase): indefinite

Prior Years Funds

Year	Site Information.....	Expenditures	FY Total
FY05	IRA for LCAAP-010.....	\$2.095K	
	IRA at LCAAP-016.....	\$170K	
	IRA/REM for LCAAP-018 (Area 18).....	\$1,110K	
	RA(C) at LCAAP-036 for GFPR(PBC).....	\$13,059K	
	RA(O) at LCAAP-036 for USACE NWKC Spt.....	\$90K	\$16,524K
Total Funding up to FY05:		\$102,673K	

Current Year Funds

Year	Site Information.....	Expenditures	FY Total
FY 06	\$15,694K	\$15,694K

Total Funding FY06: \$15,694K

Total Future Requirements: \$76,890K

Total Program Cost (from inception to completion of the IRP): \$195,257K

Community Involvement

A Technical Review Committee met quarterly from December 1987 until December 1996. In 1996, LCAAP held a public meeting to determine interest in forming a Restoration Advisory Board (RAB). The RAB first met in May 1997 and met every two months. Since January 1999, RAB meetings have been held quarterly.

The Committee Relations Plan for LCAAP was updated in January 2005. In 2005, the RAB met five times. Also, two Public Availability Meetings were held for the Area 10 Sand Piles and Inactive Sumps Removal Actions.